U.S. Nuclear Regulatory Commission Site-Specific RO Written Examination	
Applicant Information	
Name:	
Date: September 28, 2017	Facility/Unit V.C. Summer Unit 1
Region: I ☐ II ☒ III ☐ IV ☐	Reactor Type: W ☒ CE ☐ BW ☐ GE ☐
Start Time:	Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80 percent. Examination papers will be collected 6 hours after the examination begins

Applicant Certification

All work done on this examination is my own. I have neither given nor received aid.

_____
Applicant's Signature

Results	
Examination Value	_____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

1. Given the following plant conditions:
   - The reactor is at 100% power.
   - The **reference** leg of Pressurizer Level transmitter LT-460 has physically separated from the transmitter port.

   Which ONE of the choices below completes the following statements?

   Indication derived from LT-460 will be __(1)__ than actual.

   This event __(2)__ cause an actual loss of reactor coolant.

   A. 1) higher
      2) will **not**

   B. 1) higher
      2) will

   C. 1) lower
      2) will **not**

   D. 1) lower
      2) will

2. Given the following plant conditions:

   - A small break loss of coolant accident has occurred.
   - EOP-2.1, POST-LOCA COOLDOWN AND DEPRESSURIZATION is in progress.
   - All Reactor Coolant Pumps have been stopped.
   - All S/G narrow range levels are approximately 60% and stable.
   - Steam generator pressures are at 845 psig and decreasing.
   - RCS pressure is 1600 psig and decreasing.
   - Narrow Range RVLIS reads 85% and decreasing.
   - RCS T_{COLDS} are at 526°F and decreasing.
   - RCS T_{HOTS} are at 550°F and decreasing.
   - RB pressure is at 3 psig and decreasing.

   Which ONE of the choices below completes the following statements?

   In order to verify natural circulation, EOP-2.1 requires verification that ___(1)___ temperatures are at the saturation temperature for the associated steam generator pressure.

   In the current condition, the steam generators __(2)__ removing heat from the reactor coolant system.

   A. 1) T_{HOT}
      2) are

   B. 1) T_{COLD}
      2) are

   C. 1) T_{HOT}
      2) are **not**

   D. 1) T_{COLD}
      2) are **not**

3. Given the following plant conditions:

Time 0700:

- 100% power.
- The "A" Emergency Diesel REMOTE/LOCAL/MAINT Switch is taken to MAINT.
- 1DA and 1DB are energized from their respective NORM FEED breakers.

Time 0800:

- XSW1DA 03, EMERG DIESEL GEN A XEG0001A-DG is racked DOWN.
- 1DA and 1DB remain energized from their respective NORM FEED breakers.

Time 1010:

- A spurious lockout occurred on bus 1DX due to a faulty relay actuation.

Time 1015:

- A large break LOCA occurred.

Time **now** 1020.

Which ONE of the choices answers both of the following questions?

Entry into an action statement in T.S. 3.8.1.1, AC SOURCES was **first** required at time __(1)__.

At the current time of 1020, __(2)__ train(s) of ECCS equipment is (are) operating as required.

ASSUME NO OPERATOR ACTIONS AFTER THE REACTOR TRIP

A. 1) 0700.
   2) **only** one

B. 1) 0800.
   2) **only** one

C. 1) 0700.
   2) **both**

D. 1) 0800.
   2) **both**

4. Given the following plant conditions:

   Time 0500:

   - 100% power.
   - "A" CCW train is active.
   - A cooling coil in the "A" RCP Thermal Barrier Heat Exchanger has **completely ruptured**.

   Time **now** 0501:

   Which ONE of the following indications will be present now?

   A. "A" CCW pump amps increase.

   B. CCW Surge Tank Level lowers.

   C. MVG-9600, TO THERM BARR ISOL closes.

   D. MVT-9593A, FROM RCP A THERM BARR closes.

5. Given the following plant conditions:

   - 100% power.
   - The running Charging pump tripped.
   - AOP-102.2, LOSS OF CHARGING is in progress.
   - A Charging pump has been started.
   - Pressurizer level is 50% and rising.
   - The NROATC has been directed to restore letdown in accordance with SOP-102, CHEMICAL AND VOLUME CONTROL SYSTEM.
     - LCV-459 and LCV-460, LTDN LINE ISOL are both open.
     - FCV-122, CHG FLOW is in MANUAL.
     - TI-140, REGEN HX OUT TEMP °F, reads 325°F and lowering.
     - PCV-145, LO PRESS LTDN is in AUTO.

       PI-145, LO PRESS LTDN PRESS PSIG at 350 psig.
     - TCV-144, CC TO LTDN HX is in AUTO

       VCT temperature is at the desired value.

   Which ONE of the choices below completes the following statement?

   In accordance with SOP-102, FCV-122, CHG FLOW will be placed in AUTO _____.

   A. at the current pressurizer level; Pressurizer level has reached the programmed level for the current power.

   B. at the current pressurizer level; FCV-122 will automatically restore pressurizer level to program.

   C. at a higher pressurizer level; This will allow a transfer of FCV-122 to AUTO with a minimum amount of control perturbation.

   D. at a higher pressurizer level; Flow must be maintained to lower Regenerative Heat exchanger temperature to a lower value.

6. Initial conditions:

   - RCS T_{COLD} temperature is 285°F.
   - "A" RHR loop in cooldown mode.
   - Pressurizer PORVs PCV-445A, PCV-444B and PCV-445B are in AUTO.
   - Pressurizer PORV Block Valves MVG-8000A, B and C are **open**.
   - A 20 gpm RCS leak to the RB is detected.

   Current conditions:

   - RCS T_{COLD} temperature is 310°F.
   - MVG-8701A and MVG-8702A, RCS LP A TO PUMP A are **closed** for leak isolation.
   - MVG-8701B and MVG-8702B, RCS LP C TO PUMP B are **open**.

   Which ONE of the choices below answers both of the following questions?

   1) Is the T.S. 3.4.9.3, OVERPRESSURE PROTECTION SYSTEMS LIMITING CONDITION FOR OPERATION (LCO) applicable for the **current** RCS temperature?

   2) **If it is assumed that T.S. 3.4.9.3 is applicable** in the current condition, are there sufficient pressure relief devices in service to fully meet the T.S. 3.4.9.3, LCO **without** reliance on an action statement?

   A. 1) Yes.
      2) Yes.

   B. 1) Yes.
      2) No.

   C. 1) No.
      2) Yes.

   D. 1) No.
      2) No.

7. Initial conditions:

   - 100% power.
   - RCS pressure is 2235 psig and stable.
   - All systems are in automatic.
   - Group 2 backup heater control switch is in AFTER TRIP.
   - Group 1 backup heater control switch is in AFTER CLOSE.

   Current condition:

   - The pressurizer pressure master controller setpoint potentiometer fails to a setting of 2275 psig.

   Which ONE of the following describes the status of the stated Pressurizer pressure control system components **5 seconds after** the potentiometer failure?

   Assume a step change in the controller setpoint.

	Group 2 B/U Heaters	**Spray Valves**
A.	ON	CLOSED
B.	OFF	CLOSED
C.	OFF	OPEN
D.	ON	OPEN

8. Given the following plant conditions:

   - 100% power.
   - Train "B" SSPS testing was in progress in accordance with STP-345.074, SSPS ACTIVATION LOGIC AND MASTER RELAY TEST FOR TRAIN B.
   - A feedwater malfunction is occurring.
   - All Narrow Range Steam Generator levels are at 33% and decreasing.
   - The following Reactor Protection system breaker position indications are present on Control Board XCP-6110:

	GREEN light	**RED light**
RX TRIP BKR A	OFF	ON
RX TRIP BKR B	ON	OFF
BYPASS BKR A	OFF	OFF
BYPASS BKR B	OFF	ON

Which ONE of the choices below completes the following statement?

A failure of the automatic reactor trip function __(1)__ occurred.

By plant design, the indicating lights for __(2)__ will change state if switch RX TRIP CS-CR01 at panel XCP-6110 is taken to the TRIP position.

A. 1) has
   2) **only** RX TRIP BKR A

B. 1) has
   2) RX TRIP BKR A **and** BYPASS BKR B

C. 1) has **not**
   2) **only** RX TRIP BKR A

D. 1) has **not**
   2) RX TRIP BKR A **and** BYPASS BKR B

9. Given the following plant conditions:

   - Tube ruptures have occurred on "B" **and** "C" Steam Generators.
   - A reactor trip and safety injection occurred.
   - RCS pressure is 1400 psig.
   - "B" Steam Generator pressure is 1100 psig.
   - "C" Steam Generator pressure is 1025 psig.
   - RCS temperature is 542°F.

   Which ONE of the following is **closest** to the expected condition of the RCS if it is depressurized to the **exact** pressure at which all primary to secondary leakage stops?

   Assume that RCS temperature and steam generator pressures remain constant during the RCS depressurization.

   A. 4°F subcooled.

   B. 7°F subcooled.

   C. 14°F subcooled.

   D. 16°F subcooled.

10. Given the following plant conditions:

Time 10:00

- 8% power.
- "A" Main Feedwater pump is running.
- "B" and "C" Main Feedwater pumps are **not** running.
  - Their associated TRIP/RESET switches indicate RESET.
- Turbine-driven EFW pump is OFF.
- "A" and "B" MD EFW Pumps are in NORMAL AFTER STOP.
- Hand Controllers IFV-3531(3541)(3551), MD EFP TO SG A(B)(C) are at **0% and indicate full closed.**
- Flow Control Valve Switches FCV-3531(3541)(3551), MD EFP TO SG A(B)(C) are in MANUAL**.**

Time 10:02

- "A" Main Feedwater pump has **tripped**.
- Steam Generator (S/G) narrow range levels have decreased steadily to the following values:

  "A" S/G is 33%. "B" S/G is 45%. "C" S/G is 48%.

Which ONE of the choices below completes the following statements?

__(1)__ Emergency Feedwater pumps are running.

IFV-3531(3541)(3551), MD EFP TO SG A(B)(C) are __(2)__.

Assume no operator actions.

A. 1) **No**
   2) closed.

B. 1) The "A" and "B" motor-driven **and** the turbine-driven
   2) 100% open.

C. 1) **Only** the "A" and "B" motor-driven
   2) 100% open.

D. 1) **Only** the "A" and "B" motor-driven
   2) closed.

11. Given the following plant conditions:

    Initial conditions:

    - 100% power.
    - Turbine-driven EFW Pump is **inoperable.**
    - All offsite power is lost (115 KV and 230 KV).

    Current conditions:

    - Operators are in EOP-1.1, REACTOR TRIP RESPONSE.
    - Both EDGS are tripped and will **not** start from the control room.
    - SG narrow range levels are 20%, decreasing slowly.

    Which ONE of the following describes the **next** procedure transition from EOP-1.1 and the **first** high level step that is performed in that procedure?

    A. EOP-15.0, FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK;
       Check if secondary heat sink is required.

    B. EOP-15.0, FR-H.1 RESPONSE TO LOSS OF SECONDARY HEAT SINK;
       Try to establish EFW flow to at least one SG.

    C. EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER;
       Verify the Reactor is tripped.

    D. EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER;
       Try to restore power to any ESF bus.

12. Given the following plant conditions:

    Time 0700:

    - 75% power.
    - "A" CCW train is active.
    - "B" CCW pump is **inoperable**.
    - There are no Technical Specification Action Statements in effect.

    Time 0710:

    - APN-5903 is **deenergized** due to a malfunction.

    Time 0715:

    - A large break LOCA occurred.
    - A loss of all offsite power (115 KV and 230 KV) occurred after the reactor trip.
    - EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION is in progress.

    Which ONE of the choices below completes the following statement?

    While performing EOP-1.0, ATTACHMENT 3, SI EQUIPMENT VERIFICATION, the BOP will find "C" CCW pump_____.

    A. **off** and a manual start will be required because an automatic start is prevented by the ESFLS AUTO START BLOCK function.

    B. **off** and a manual start will be required because the "B" Train ESFLS is deenergized.

    C. **running** because a "A" CCW header pressure decreased below the autostart setpoint.

    D. **running** because it was aligned to operate as the "B" train CCW pump.

13. Given the following plant conditions:

- A sustained loss of offsite and onsite power has occurred.
- An ELAP has been declared.
- EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER is in progress.
- The following annunciators are noted to be in alarm:
  - XCP-636, 4-4, TRAIN A BATT CHGR TRBL XBC1A/1A-1B.
  - XCP-637, 4-4, TRAIN B BATT CHGR TRBL XBC1B/1A-1B.
- Meters on the Main Control Board read as follows:
  - 1A DC VOLTS 104 VDC and decreasing.
  - 1A DC AMPS 0 amps and stable.
  - 1A-1B DC AMPS 0 amps and stable.
  - 1B DC AMPS 0 amps and stable.
  - 1B DC VOLTS 104 VDC and decreasing.

Which ONE of the choices completes the following statements?

Entry into FSP-7.0, LOSS OF VITAL INSTRUMENTATION OR CONTROL POWER __(1)__ required in accordance with EOP-6.0.

Restoration of power to __(2)__ will allow the TRAIN A BATT CHGR TRBL XBC1A/1A-1B alarm to clear.

A. 1) is
   2) XMC1DA2Z

B. 1) is
   2) XMC1DA2X

C. 1) is **not**
   2) XMC1DA2Z

D. 1) is **not**
   2) XMC1DA2X

14. Given the following plant conditions:

    - 100% power initially.
    - Both Emergency Diesels are **inoperable** and out of service due to a common mode failure.
    - The following occur simultaneously:
        - Large break LOCA.
        - Overcurrent lockout of XTF0031, EMERGENCY AUXILIARY TRANSFORMER.

    Which ONE of the following identifies a valid alarm that would be present for the given conditions?

    A. XCP-601, 1-3, CCP A/C TRIP FAIL.

    B. XCP-605, 2-4, SWBP B SUCT/DISCH PRESS LO.

    C. XCP-619, 1-1, RCP C TRIP.

    D. XCP-634, 1-5, BUS 1A3/1C3 AUTO XFER.

15. Given the following plant conditions:

- 50% power and stable.
- AOP-301.1, RESPONSE TO ELECTRICAL GRID ISSUES is in progress.
- The System Controller **suspended** administrative limits for MVAR loading and requested that VC Summer establish the maximum **LAG** MVARs.
- The BOP is adjusting Main Generator Voltage.
- The AC MEGAVARS meter is at 90 MVARs and increasing in the positive direction.

Which ONE of the choices below answers both of the following questions in accordance with AOP-301.1:

1) What is the VC Summer **maximum** limit for LAG MVAR load when the administrative limits of AOP-301 do not apply?

2) If administrative limits will be exceeded, what condition does the reference page of AOP-301.1 identify as a potential adverse effect if the **maximum** limit for LAG MVARs is violated?

A. 1) 325 MVARs.
   2) Main generator overheating.

B. 1) 325 MVARs.
   2) Excessive load currents.

C. 1) 484 MVARs.
   2) Main Generator overheating.

D. 1) 484 MVARs.
   2) Excessive load currents.

16. Initial conditions:

    - 100% power initially.
    - "A" EDG is **inoperable** and out of service.
    - A break has occurred one (1) foot downstream of MVG-8888B, RHR LP B TO COLD LEGS.
        - A reactor trip and safety injection automatically actuated **as a result** of the break.

    Current conditions:

    - RWST level is 17% and decreasing.
    - A loss of 230 KV power has occurred.

    Which ONE of the following identifies why cold leg recirculation **cannot** be satisfactorily implemented for this event?

    A. "A" RHR pump is deenergized and "B" RHR train cannot discharge to the RCS.

    B. Emergency Operating procedures will require closing RHR pump discharge valves.

    C. RCS pressure will remain above the discharge pressure of the RHR pumps.

    D. RHR pumps will not have a suction source for cold leg recirculation.

17. Given the following plant conditions:

- A LOCA has occurred.
- Both RHR pumps are **inoperable**.
- EOP-2.4, LOSS OF EMERGENCY COOLANT RECIRCULATION is in progress.
- RWST level is 30% and decreasing.
- Operators have just stopped "B" Charging pump.
- "A" Charging pump is running in injection mode.
- RCS subcooling is 5°F.

Which ONE of the choices below completes the following statement regarding the reason for stopping the **"B"** Charging pump?

Operators stopped the "B" charging pump _____.

A. to conserve the available RWST inventory.

B. to reduce RCS pressure and the RCS leakrate.

C. to protect the pump from a loss of Net Positive Suction head.

D. in preparation for aligning "A" Charging pump for normal charging.

18. Given the following plant conditions:

    - A large steam break occurred downstream of the Main Steam Isolation Valves (MSIVs).
    - An automatic reactor trip and safety injection occurred.
    - **All** MSIVs failed OPEN and could **not** be manually closed.
    - EOP-3.1, ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS (SG), is in progress.

    Which ONE of the choices below completes the following sentence?

    The reason for the CAUTION in EOP-3.1 that requires establishing minimum EFW flow to each SG that has a Narrow Range level LESS THAN 26% is to _____.

    A. minimize thermal shock to SG components.

    B. maintain the ability to diagnose a subsequent SG tube rupture.

    C. maintain a cooldown rate in the RCS Cold Legs LESS THAN 100°F/hr.

    D. prevent damage to EFW pumps due to operating for long periods of time at low flow conditions.

19. Given the following plant conditions:

    - 50% power.
    - TREF 1ST STG PRESS switch is selected to PT446, CH III
    - Rods are in AUTO.
    - The NROATC notes a **prompt** change to a First Stage Pressure Transmitter indication.
    - First Stage Pressure Transmitter indications read as follows:
        - PT-446 indicates 750 psig and stable.
        - PT-447 indicates 360 psig and stable.

    Which ONE of the choices below completes the following statement?

    For the given conditions, Control Rods should be automatically __(1)__ at __(2)__ steps per minute.

A. 1) withdrawing
   2) 48

B. 1) withdrawing
   2) 72

C. 1) inserting
   2) 48

D. 1) inserting
   2) 72

20. Initial conditions:

- A small break LOCA has occurred.
- EOP-2.1, ES-1.2 POST LOCA COOLDOWN AND DEPRESSURIZATION is in progress.
- All RCPs are OFF.
- "A" and "B" Charging pumps are running in injection mode.
- The RO is depressurizing the RCS using a Pressurizer PORV.
- Core Exit TCs are 557°F and stable.
- Pressurizer Level is 0%.
- NR RVLIS is 75% and stable.

Current conditions:

- The RO reports that the open Pressurizer PORV **cannot** be closed.
- Core Exit TCs are 590°F and increasing.
- RCS pressure is 1365 psig and decreasing.
- Pressurizer Level is 23% and increasing at 1% per second.
- NR RVLIS is 50% and decreasing.

Which ONE of the following describes the reason for the change in Pressurizer level in the **current** conditions above?

A. Charging pump flowrates are **not** increasing but approximately half of the reactor vessel head is voided with an expanding steam volume.

B. Charging pump flowrates are **not** increasing but the reactor vessel head is completely voided with core voiding now occurring.

C. Charging pump flowrates are increasing **and** the reactor vessel head is completely voided with core voiding now occurring.

D. Charging pump flowrates are increasing **and** approximately half of the reactor vessel head is voided with an expanding steam volume.

21. Given the following plant conditions:

    - "A" Waste Gas Decay Tank is in service.

    Which one of the choices below complete the following statements in accordance with T.S. 3.11.2.6, RADIOACTIVE EFFLUENTS - GAS STORAGE TANKS?

    If the noble gas activity in "A" Waste Gas Decay Tank reaches __(1)__ curies, then additions to the tank must be immediately stopped.

    There __(2)__ a requirement in the action statement(s) to reduce the curie content of the tank less than this limit within one hour.

    A. 1) 10
       2) is

    B. 1) 10
       2) is **not**

    C. 1) 131,000
       2) is

    D. 1) 131,000
       2) is **not**

22. Given the following plant conditions:

    - A plant fire occurred.
    - EPP-013, FIRE EMERGENCY was used to respond.
    - The fire has been extinguished.

    Which ONE of the choices below answers both of the following questions regarding the guidance in EPP-013:

    Fire Brigade members are expected to apply an extinguishing agent on the fire within __(1)__ minutes of the station fire alarm.

    After the fire is extinguished, a reflash watch will be posted for __(2)__ minutes.

    A. 1) 20
       2) 20

    B. 1) 20
       2) 30

    C. 1) 30
       2) 20

    D. 1) 30
       2) 30

23. Which ONE of the following identifies an instrument function on the Control Room Evacuation Panel (CREP) that is required to be OPERABLE in accordance with T.S. 3.3.3.5, REMOTE SHUTDOWN INSTRUMENTATION?

    A. Reactor Vessel level.

    B. Steam Generator level.

    C. Reactor Building pressure.

    D. Core Exit Thermocouple temperatures.

24. Given the following plant conditions:

- The NROATC has noticed that the RM-L1, CVCS LETDOWN HIGH & LOW LIQUID RADIATION MONITOR meter indication has **increased**.
- Chemistry is contacted to sample for RCS activity.
- The CRS directs the NROATC to perform an operational check of RM-L1 in accordance with SOP-124, PROCESS AND AREA RADIATION MONITORING SYSTEM.

Which ONE of the choices below completes the following statements?

RM-L1 __(1)__ have an associated INTERLOCK switch that must be turned while performing SOP-124, Section 3. E. LIQUID MONITOR OPERATIONAL CHECK.

To check for the proper RM-L1 **detector** response, the operator will depress the __(2)__ pushbutton.

A. 1) does
   2) HI-RAD

B. 1) does
   2) NOR-CS

C. 1) does **not**
   2) HI-RAD

D. 1) does **not**
   2) NOR-CS

25. Initial conditions:

- 100% power initially.
- A LOCA occurred.
- The reactor tripped and safety injection actuated.
- RCPs are off.
- RCS pressure is 1100 psig and decreasing.
- EOP-16.0, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK is in progress.
- Safety Injection has been terminated.
  - Operators are reading step 14, **"Isolate all SI accumulators".**

Which ONE of the choices below completes the following statements?

Prior to the Safety Injection, MVG-8808A, B and C, Accumulator Discharge Isolation Valves were __(1)__.

If any Accumulators were to remain **unisolated and unvented**, a decrease of RCS pressure to **575 psig** would result in injection of __(2)__ into the RCS

A. 1) open.
   2) **only** additional cooling water

B. 1) open.
   2) additional cooling water **and** nitrogen

C. 1) closed and opened automatically when SI occurred.
   2) **only** additional cooling water

D. 1) closed and opened automatically when SI occurred.
   2) additional cooling water **and** nitrogen

26. Given the following plant conditions:

- A loss of 230 KV power occurred.
- The reactor is tripped.
- A Technical Specification action statement requires taking the plant to COLD SHUTDOWN expeditiously.
- EOP-1.4 NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL is in progress.
- Operators are performing an RCS cooldown.
- Narrow Range RVLIS is 72% and decreasing.

Which ONE of the choices below completes the following statements?

In the current condition, steam voiding in the reactor vessel is more likely to occur because __(1)__ are **not** available.

In accordance with a **note** in EOP-1.4, maintaining Narrow Range RVLIS close to __(2)__ will allow subcooled RCS liquid to condense steam from the reactor vessel head.

A. 1) CRDM cooling fans
   2) 70%

B. 1) CRDM cooling fans
   2) 93%

C. 1) pressurizer backup heaters
   2) 70%

D. 1) pressurizer backup heaters
   2) 93%

27. Given the following plant conditions:

- A large break LOCA occurred.
- The actions of EOP-2.2, ES-1.3 TRANSFER TO COLD LEG RECIRCULATION are complete.
- The NROATC reports that RB sump levels are continuing to increase.

Which ONE of the choices below completes the following statements?

The **minimum** RHR Sump level which is the entry condition for EOP-17.1, REACTOR BUILDING FLOODING is __(1)__ feet.

The RB sump will be sampled by chemistry in EOP-17.1 to assist in determining the __(2)__.

A. 1) 414
   2) source of the unexpected water in the sump.

B. 1) 414
   2) effect of the unanticipated water volume on sump pH.

C. 1) 419.5
   2) source of the unexpected water in the sump.

D. 1) 419.5
   2) effect of the unanticipated water volume on sump pH.

28. Given the following plant conditions:

- Mode 4.
- Reactor Coolant Pump 'A' is to be started.
- The operator notes the following:

  (1) NR PRESS PSIG PI-402A is 250 psig.

  (2) VCT pressure is 40 psig.

  (3) "A" RCP Seal Injection flow is 5.0 GPM.

  (4) "A" RCP CBO flow is 1.0 gpm.

Which ONE of the following contains **all** the parameters, as numbered above, that individually would **prevent** the operator from starting "A" RCP in accordance SOP-101, REACTOR COOLANT SYSTEM?

A. (1) and (3)

B. (1) and (4)

C. (2) and (3).

D. (2) and (4).

29. Given the following plant conditions:

- The plant is in Mode 5.
- The pressurizer is solid.
- RCS temperature is 150°F.
- RCS pressure is 350 psig.
- "A" RHR Train is aligned for shutdown cooling.
- Low pressure letdown is in service.
- PCV-145, LO PRESS LTDN is in AUTO, set at 350 psig.

Which ONE of the following describes an event that will cause both PCV-145 to **initially** throttle closed and RCS pressure to **initially** increase upon initiation of the event?

A. Tripping the in-service RHR Pump

B. Throttling FCV-122, CHG FLOW from 100% open to 50% open.

C. Increasing CCW flow through an in-service RHR heat exchanger.

D. Throttling HCV-142, LTDN FROM RHR from 50% open to 100% open.

30. Given the following plant conditions:

- Mode 4.
- Operators are performing a cooldown using the "B" RHR train.
- FCV-603B, B RHR HX DISCH VLV is throttled 75% open.
- FCV-605B, RHR HX BYP is in manual and 75% open.
- The CRS has directed the NROATC to increase the cooldown rate using FCV-605B, RHR HX BYP.

Which ONE of the choices below completes the following statement?

The NROATC will adjust FCV-605B further __(1)__ to increase the cooldown rate.

The indication as read on FI-605B, PUMP B FLOW GPM will __(2)__ as a result of the adjustment.

A. 1) open
   2) **not** change

B. 1) open
   2) increase

C. 1) closed
   2) decrease

D. 1) closed
   2) **not** change

31. Given the following plant conditions:

- The plant was operating at 100% power.
- A large break loss of coolant accident occurred.
- Operators are in the process of establishing Cold Leg Recirculation in accordance with EOP-2.2, TRANSFER TO COLD LEG RECIRCULATION.

Which ONE of the choices below answers both of the following questions?

1) Which ESF system suction(s) must be **manually** transferred from the RWST in accordance with EOP-2.2?

2) Which signal(s) must be reset in order to satisfy the **circuit logic** that will allow the transfer(s)?

A. 1) Charging system **only**.
   2) Safety Injection **and** Phase A signals.

B. 1) Charging system **only**.
   2) Safety Injection signal **only**.

C. 1) Charging **and** RB Spray systems.
   2) Safety Injection **and** Phase A signals.

D. 1) Charging **and** RB Spray systems.
   2) Safety Injection signal **only**.

32. Initial conditions:

- Small break LOCA was in progress.
- MVG-8808A, B and C, Accumulator Discharge Isolation Valves are **energized**.

Current conditions:

- XCP-641, 1-1, BUS IDB O/C 51BX-1DB is in alarm.
- Operators have determined that the alarm is valid.

Which ONE of the choices below identifies the Accumulator Discharge Isolation valves that are still **energized**?

A. **Only** MVG-8808A.

B. **Only** MVG-8808C.

C. **Only** MVG-8808A **and** MVG-8808B.

D. **Only** MVG-8808A **and** MVG-8808C.

33. Given the following plant condition:

- 100% power initially.
- A LOCA occurred.
- Operators entered EOP-16.0, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK, due to a **RED** status on Critical Safety Function Status Trees.
- Safety injection has been terminated.
- Operators have determined that a **soak** is required.

Which ONE of the choices below completes the following statements?

A cooldown greater than 100°F in one hour __(1)__ required to cause a pressurized thermal shock concern with a **RED** status on the INTEGRITY Critical Safety Function Status Tree.

The conditions for the soak will be maintained for a **minimum** period of __(2)__ hour(s) to relieve thermal stresses.

A. 1) is
   2) one

B. 1) is
   2) four

C. 1) is **not**
   2) one

D. 1) is **not**
   2) four

34. Given the following plant conditions:

- 100% power.
- XCP-616, 4-4, PRT LVL LO/TEMP/LVL/PRESS HI.
- PRT conditions are as follows:

Temperature	115°F.
Level	66%.
Pressure	7 psig.

Which ONE of the following describes the parameter causing the alarm and the method that can be used to clear the alarm?

A. Pressure is high;

Drain the PRT to the Recycle Holdup tank.

B. Pressure is high;

Vent the PRT to the Waste Gas System.

C. Temperature is high;

Cool the PRT with the RCDT heat exchanger using Service Water to cool the heat exchanger.

D. Temperature is high;

Cool the PRT with the RCDT heat exchanger using Component Cooling Water to cool the heat exchanger.

35. Given the following plant conditions:

    - Reactor power is 100%.
    - The crew is in AOP-118.1, LOSS OF COMPONENT COOLING WATER.

    Which ONE of the choices below completes the following statement?

    In accordance with AOP-118.1, operators will trip RCPs if component cooling water is **not** restored to the RCP motor bearing coolers within a **maximum** allowed time of __(1)__ minutes or if motor bearing temperatures increase to a **minimum** value of __(2)__.

    A. 1) 10
       2) 195°F

    B. 1) 10
       2) 250°F

    C. 1) 20
       2) 195°F

    D. 1) 20
       2) 250°F

36. Time 1000:

- The plant was operating at 80% power.
- Pressurizer pressure was at 2235 psig and stable.
- Pressurizer heater control switches were as pictured below.

Time 1001:

- The NROATC took the PZR PRESS MASTER CONTROL to MANUAL and pressed the **down** arrow pushbutton until the output % meter deflection was **0%** (Bottom of the scale).

Which ONE of the choices below completes the following statement?

As a result of taking the output meter to 0%, the BU GRP 1 AMPS indication __(1)__.

At time 1001 the **BU GRP 2** breaker **RED** light is __(2)__.

A. 1) increased
   2) LIT (on).

B. 1) increased.
   2) DARK (off).

C. 1) remain the same
   2) LIT (on).

D. 1) remain the same
   2) DARK (off).

37. Given the following plant conditions:

Time 0700:

- 100% power.
- Plant personnel have begun performing STP-345.037, SOLID STATE PROTECTION SYSTEM ACTUATION LOGIC AND MASTER RELAY TRAIN A.
- Reactor Protection system breaker positions are as follows:

Trip Breaker Position	
Bypass breaker "A" (BYA)	Racked in and CLOSED
Reactor Trip breaker "A" (RTA)	Racked in and CLOSED
Bypass breaker "B" (BYB)	Racked out and OPEN
Reactor Trip breaker "B" (RTB)	Racked in and CLOSED

Time 0701:

- All Train **"A"** Logic Cabinet switches are in NORMAL.
- The Train **"B"** MULTIPLEXER TEST switch is taken **out** of the NORMAL position.

Which ONE of the choices below completes the following statements?

__(1)__ will be in alarm and operators will **next** __(2)__.

A. 1) **Only** XCP-605, 2-6, SSPS B TRAIN TRBL
   2) perform immediate actions of EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION.

B. 1) **Only** XCP-605, 2-6, SSPS B TRAIN TRBL
   2) record entry into a one hour Technical Specification action statement.

C. 1) **Both** XCP-604, 2-6, SSPS A TRAIN TRBL **and** XCP-605, 2-6, SSPS B TRAIN TRBL
   2) perform immediate actions of EOP-1.0, E-0 REACTOR TRIP OR SAFETY INJECTION.

D. 1) **Both** XCP-604, 2-6, SSPS A TRAIN TRBL **and** XCP-605, 2-6, SSPS B TRAIN TRBL
   2) record entry into a one hour Technical Specification action statement.

38. Given the following plant conditions:

Time 0400.

- 100% power.
- Reactor Building Pressure transmitter IPT-953 was **inoperable**.
- All actions associated with HI-1, HI-2 and HI-3 bistables actuated by PT-953 are **complete** in accordance with SOP-401, REACTOR PROTECTION AND CONTROL SYSTEM.

Time 0500:

- APN-5902 deenergized due to equipment malfunctions.

Which ONE of the choices below completes the following statements?

Power for IPT-953 is supplied from __(1)__.

At time 0500, a Reactor Building Spray actuation __(2)__ occur.

Assume no operator actions.

A. 1) APN-5903
   2) did

B. 1) APN-5903
   2) did **not**

C. 1) APN-5904
   2) did

D. 1) APN-5904
   2) did **not**

39. Given the following plant conditions:

- 100% power.
- RBCU TRAIN A EMERG switch is selected to XFN-64A.
- A Safety Injection occurs.
- The BOP is performing Attachment 3 of EOP-1.0, SI EQUIPMENT VERIFICATION.

Which ONE of the following choices below completes the following statements?

The **minimum** flow that the BOP is required to verify **in each train** of RBCUs, in accordance with EOP-1.0, Attachment 3, is greater than a **minimum** value of __(1)__.

XFN0065A-AH (RBCU-65A) __(2)__ have service water flow through its cooling coils.

A. 1) 2000 gpm.
   2) will

B. 1) 2000 gpm.
   2) will **not**

C. 1) 4000 gpm.
   2) will

D. 1) 4000 gpm.
   2) will **not**

40. Initial conditions:

- 100% power.
- Operators are preparing to start XFN0065B 2B to reduce RB temperature.

Current conditions:

- The average RB temperature as noted on station logs is 110°F.
- XFN-64B/XFN 65B - RBCU TRAIN B EMERG is selected to XFN 64B.
- The NROATC took the XFN0065B 2B **NORM (fast speed)** control switch to START for 1 second and released the switch.
- The NROATC noted the following indications:
  - The red running light remained dim.
  - Fan amps remained at 0 amps.

Which ONE of the choices below answers both of the following:

1) Is L.C.O. T.S. 3.6.1.5 CONTAINMENT SYSTEMS - AIR TEMPERATURE currently met?
2) What action will allow the operator to start Fan XFN-65B in accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM?

A. 1) T.S. 3.6.1.5 L.C.O. is met;

2) The XFN-64B/XFN 65B - RBCU TRAIN B EMERG must be selected to XFN 65B prior to taking the control switch to START.

B. 1) T.S. 3.6.1.5 L.C.O. is met;

2) The XFN0065B 2B NORM switch must be held to START until the red running light is lit and fan amps are indicated.

C. 1) T.S. 3.6.1.5 L.C.O. is **not** met;

2) The XFN-64B/XFN 65B - RBCU TRAIN B EMERG must be selected to XFN 65B prior to taking the control switch to START.

D. 1) T.S. 3.6.1.5 L.C.O. is **not** met;

2) The XFN0065B 2B NORM switch must be held to START until the red running light is lit and fan amps are indicated.

41. Given the following plant condition:

- The plant is in Mode 3 with a cooldown in progress.
- The NaOH tank in the Reactor Building Spray system contains a volume of 3175 gallons.

Which ONE of the choices below answers both of the following questions in accordance with T.S. 3.6.2.2, SPRAY ADDITIVE SYSTEM:

1) Will T.S. 3.6.2.2 be applicable when the plant transits to Mode 4?
2) Does the volume of NaOH meet the requirements of the T.S. 3.6.2.2 LCO without reliance on an action statement?

A. 1) No.
   2) Yes.

B. 1) No.
   2) No.

C. 1) Yes.
   2) Yes.

D. 1) Yes.
   2) No.

42. Initial conditions:

- The plant is shutdown.
- A plant cooldown is in progress.
- Steam Dump Bank 1 and Bank 2 are open.

Current conditions:

- RCS T_{AVG} has decreased to the Low-Low T_{AVG} setpoint.
- The "A" Train P-12 permissive signal actuates.
- "B" Train P-12 does **not** actuate due to a circuit malfunction.

Which ONE of the following describes how the Steam Dumps will automatically respond?

A. **Only** Bank 1 steam dumps will close.

B. **Only** Bank 2 steam dumps will close.

C. **Both** Bank 1 and Bank 2 steam dumps will close.

D. **Neither** Bank 1 nor Bank 2 steam dumps will close.

43. Initial conditions:

- A plant startup is in progress in accordance with GOP-4A, POWER OPERATION (MODE 1 – ASCENDING).
- Operators are preparing to transfer steam generator feed to the Main Feed Reg valves.
- The Main Feedwater Pump MASTER SPEED CNTRL is in MANUAL.
- Reactor power is 5% and stable.

Current conditions:

- Reactor power is 9% and stable.
- Transfer to the Main Feed Reg Valves is complete.

Which ONE of the following describes how Feedwater Pump discharge pressure was controlled during transfer of steam generator feed to the Main Feed Reg valves in accordance with GOP-4A?

A. MASTER SPEED CNTRL output demand is maintained between 35% and 40%.

B. MASTER SPEED CNTRL output demand is maintained between 50% and 60%.

C. MASTER SPEED CNTRL output is adjusted to maintain Feedwater pump discharge pressure 50 psig to 150 psig above steam header pressure.

D. MASTER SPEED CNTRL output is adjusted to maintain Feedwater pump discharge pressure 150 psig to 300 psig above steam header pressure.

44. Given the following plant conditions:

- The plant is operating at 100% power.
- All Main Feed Reg valves are in AUTO.
- XCP-624, 1-5, SG A LVL DEV is in alarm.
- STEAM CONTROL CHANNEL SEL FOR SG A is selected to FY474A.
- The RO determines that SG "A" Narrow Range level is decreasing slowly.
- SG "B" and "C" Narrow Range levels are stable.

Which ONE of the choices below completes the following statements?

The **minimum** deviation of "A" Steam Generator level from program that will cause XCP-624, 1-5 is __(1)__.

A malfunction that could have caused the indications above is a __(2)__.

A. 1) 10%.
   2) HIGH failure of Steam Generator pressure channel PT-475.

B. 1) 10%.
   2) a leak on the line for operating air to FCV-478, A FCV.

C. 1) 5%.
   2) HIGH failure of Steam Generator pressure channel PT-475.

D. 1) 5%.
   2) a leak on the line for operating air to FCV-478, A FCV.

45. Given the following plant conditions:

- 100% power initially.
- The reactor is tripped.
- EOP-1.1, ES-0.1 REACTOR TRIP RESPONSE is in progress.
- The PERMISV C-9 status light on XCP-6114, 1-3 is DIM.
- Steam generator NR levels are 40% and increasing.
- EFW flows are 250 gpm to each steam generator.
- RCS cold leg temperatures are 520°F and decreasing.
- Pressurizer level is 18% and decreasing.
- RB pressure is 0.5 psig and stable.

Which ONE of the choices below answers both of the following questions in accordance with EOP-1.1:

1) What is the **minimum** pressurizer level at which operators will be **required** to manually actuate Safety Injection?

2) What is an action **allowed** under the current conditions that will reduce the RCS cooldown rate?

A. 1) 8%.
   2) Reduce EFW flow to 50 gpm to each steam generator.

B. 1) 8%.
   2) Close all condenser steam dumps.

C. 1) 10%.
   2) Reduce EFW flow to 50 gpm to each steam generator.

D. 1) 10%.
   2) Close all condenser steam dumps.

46. Initial conditions:

- 100% power initially.
- A steam line break occurred on "A" Steam Generator.
- Instrument air has been lost.

The **accumulators** associated with the valves below are designed to last the **minimum required** duration of __(1)__ hours to fulfill their design function:

FCV-3531, MD EFP TO SG A
FCV-3541, MD EFP TO SG B
FCV-3551, MD EFP TO SG C

If all three of the associated accumulators are **depleted**, this will result in the loss of the ability to maintain ___(2)___

A. 1) 3
   2) EFW to "A" steam generator isolated.

B. 1) 3
   2) "B" and "C" steam generator levels for heat sink.

C. 1) 5
   2) EFW to "A" steam generator isolated.

D. 1) 5
   2) "B" and "C" steam generator levels for heat sink.

47. Given the following plant condition:

- The Unit is in Hot Standby.
- A loss of offsite power (115 KV and 230 KV) has occurred.

Which ONE of the following identifies the 480V power source that can **directly** supply bus 1B1 in the current condition?

Assume that any required interlock condition is met.

A. 1A1

B. 1DA1

C. 1C1

D. 1DB1

48. Given the following plant conditions:

Time 0100:

- 100% power initially.
- All offsite power was lost (115 KV and 230 KV).
- Both "A" and "B" EDGs failed to start.

Time 0300:

- Operators opened supply breaker 5 on DPN-2X for the Main Turbine Emergency Bearing Oil Pump. The pump was **running** when the breaker was opened.

Time 0400:

- Operators opened supply breaker 6 on DPN-1HB1 for the "B" EDG Oil Pump. The pump was **running** when the breaker was opened.

Which ONE of the following identifies whether **the available capacity** for batteries that are **required under T.S. 3.8.2**, DC SOURCES was extended and, if so, when?

A. **Not** extended for the breaker operations described above.

B. Extended at time 0300 **only**.

C. Extended at time 0400 **only**.

D. Extended at time 0300 and then extended again at 0400.

49. Given the following plant conditions:

- Work was in progress on Diesel Generator Building ventilation dampers.
- Tags have been cleared on DIESEL RM A CLG FAN A and DIESEL RM A CLG FAN B.
  - The associated control switches have been taken to AUTO.

Which ONE of the choices below completes the following statement?

DIESEL RM A CLG FAN A and DIESEL RM A CLG FAN B will automatically start _____.

A. by output from the "A" ESFLS sequencer **or** at a high room temperature setpoint.

B. upon any diesel start **or** at a high room temperature setpoint.

C. at a high room temperature setpoint **only**.

D. upon any diesel start **only**.

50. Given the following plant conditions:

- "A" EDG is operating in parallel with bus 1DA.
- Due to an error in the operation of controls, the following Main Control Board indications are present:

  - DG A KILOVARS 4100 KVAR
  - DG A KILOWATTS 4275 KW

Which ONE of the choices below completes the following statement in accordance with SOP-306 EMERGENCY DIESEL GENERATOR?

The operator can use **one** switch to establish an operating condition in which all operating limits for **continuous operation** are **met** by taking the _____.

REFERENCE PROVIDED

A. VOLT REG RAISE-LOWER to RAISE.

B. VOLT REG RAISE-LOWER to LOWER.

C. SPEED switch to RAISE.

D. SPEED switch to LOWER.

Q 50

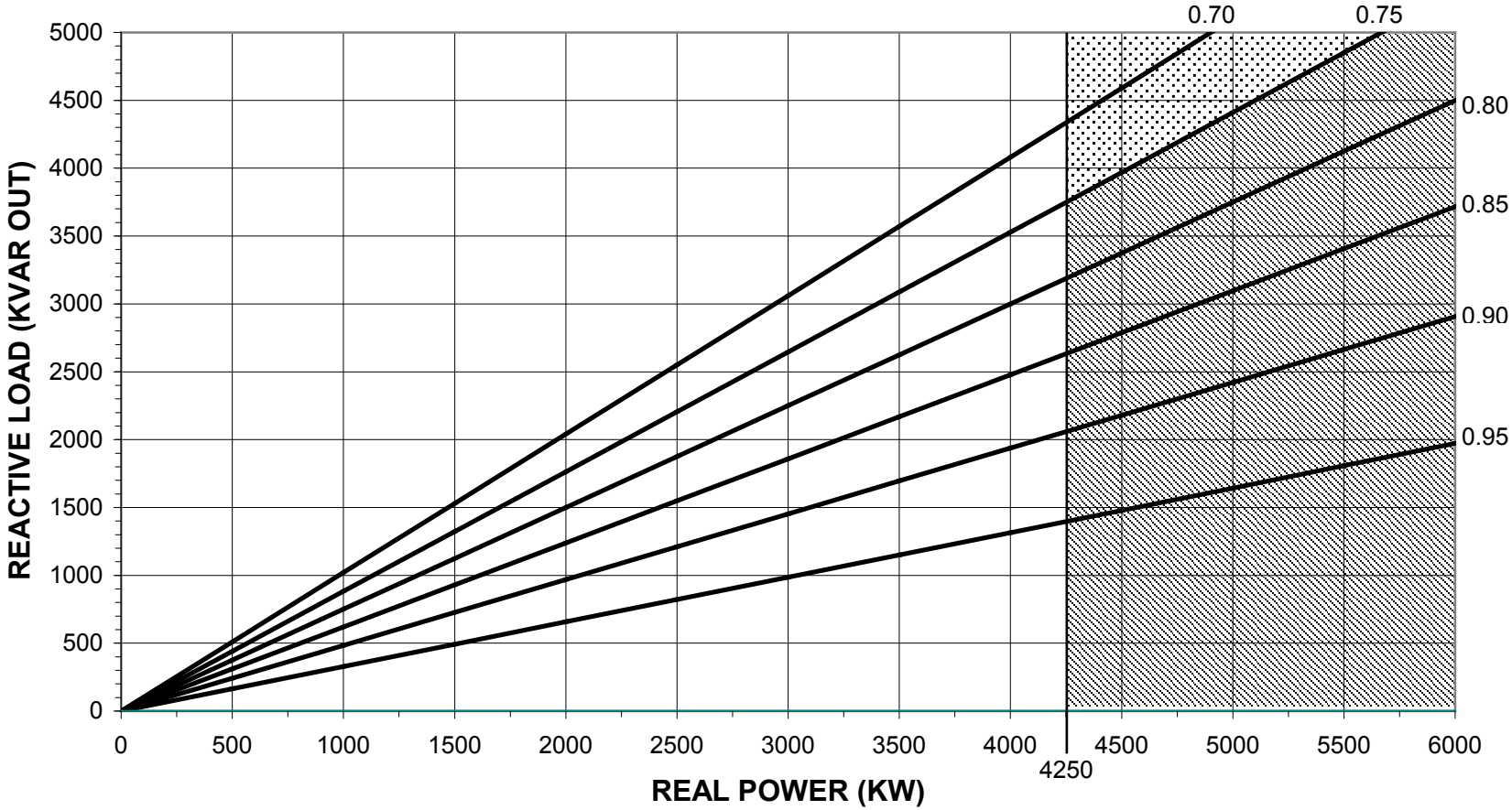
DIESEL GENERATOR POWER FACTOR

NOTE 1: This is the preferred graph for Power Factor determination since the values are independent of voltage.

NOTE 2: The machine should normally be operated with a Lagging Power Factor (KVAR OUT).

Do not operate in this zone

Emergency operation or as directed by procedure



51. Initial conditions:

- 100% power.
- A waste gas release is in progress in accordance with SOP-119, WASTE GAS PROCESSING.
- RM-A10, WASTE GAS DISCHARGE MONITOR is inoperable and out of service.

Current conditions:

- The RM-A13, MAIN PLANT EXHAUST HIGH RANGE ATMOSPHERIC MONITOR is in service.
- The RM-A3, MAIN PLANT VENT EXHAUST MONITOR detector failed high.

Which ONE of the choices below completes the following statements?

RM-A13 __(1)__ a monitor that is verified OPERABLE on SOP-119, Attachment VA, GASEOUS WASTE RELEASE WORKSHEET-CONTROL ROOM,

The failure of RM-A3 requires operators to use __(2)__ to determine the required action(s).

A. 1) is
   2) ODCM, Section 1.2.1, Radioactive Gaseous Effluent Monitoring Instrumentation.

B. 1) is
   2) T.S. 3.3.3 Radiation Monitoring Instrumentation.

C. 1) is **not**
   2) ODCM, Section 1.2.1, Radioactive Gaseous Effluent Monitoring Instrumentation.

D. 1) is **not**
   2) T.S. 3.3.3 Radiation Monitoring Instrumentation.

52. Given the following plant conditions:

- 100% power.
- Offsite power to bus 1DA was lost.
- The “A” Emergency Diesel Generator (EDG) automatically started and restored power to bus 1DA.
- There is **no** Service Water pump running on "A" train.
- The following annunciators are in alarm in the Control Room:
  - XCP-636, 6-3, DG A ENG TEMP TRBL
- An operator reports the following local conditions at the "A" EDG.
  - XCX-5201, 1-2, HIGH LUBE OIL TEMPERATURE is in alarm.
  - Lube Oil Temperature is reading 180 °F and rising.

Which ONE of the choices below completes the following statement?

Based on the current conditions, DG “A” ___(1)___ have automatically tripped; and Fire Service Water ___(2)___ have automatically aligned to the DG "A" lube oil cooler.

A. 1) should
   2) should **not**

B. 1) should **not**
   2) should **not**

C. 1) should
   2) should

D. 1) should **not**
   2) should

53. Which ONE of the following buses **directly** provides power to Service Water Pump "C" (XPP-0039C) when aligned to Service Water Loop "A" per SOP-117, SERVICE WATER SYSTEM?

A. 1EA

B. 1EB

C. 1DA

D. 1C

54. Which ONE of the choices below completes the following statements in accordance with T.S. 3.6.4, CONTAINMENT ISOLATION VALVES ?

___(1)___ is a containment isolation valve that is required to be OPERABLE in accordance with T.S. 3.6.4; This valve is automatically and **directly** closed by a ___(2)___ signal.

A. 1) MVG-9605, FROM RB LOAD ISOL
   2) Phase "A"

B. 1) MVG-9605, FROM RB LOAD ISOL
   2) Safety Injection

C. 1) PVT-2660, AIR SPLY TO RB
   2) Safety Injection

D. 1) PVT-2660, AIR SPLY TO RB
   2) Phase A

55. Given the following plant condition:

    - RM-A2, REACTOR BUILDING SAMPLE LINE MONITOR is in alarm due to a high radiation reading.

    Which ONE of the following identifies a valve that receives a signal to **automatically close** because of the RM-A2 alarm?

    A. XVB00001A, REACTOR BUILDING PURGE SUPPLY ISOLATION VALVE.

    B. XVB00002A, REACTOR BUILDING PURGE EXHAUST ISOLATION VALVE.

    C. XVB06067, CNTMT PUR EXH ISOL VLV.

    D. XVB06056, ALT PUR SPLY ISOL VLV.

56. Given the following plant conditions:

- Operators are preparing to begin withdrawing Control Banks in accordance with GOP-3 REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2).
- Source Range N-31 and N-32 HIGH FLUX AT SHUTDOWN switches are in NORMAL.

Considering the following items:

(1) Control Board alarms.

(2) RB Evacuation Alarm.

(3) Reactor trip.

Which ONE of the following contains all the items from the list above that would occur if Source Range N-31 and N-32 HIGH FLUX AT SHUTDOWN switches are **not** taken to BLOCK as required by GOP-3?

A. Item (1) **only**.

B. Items (1) and (2) **only**.

C. Items (1) and (3) **only**.

D. Items (1), (2) and (3).

57. Given the following plant conditions:

- A small break LOCA occurred.
- All EFW pumps failed to start.
- EOP-15.0, FR-H.1 RESPONSE TO A LOSS OF SECONDARY HEAT SINK is in progress.
- RB pressure is 0.5 psig and stable.
- RCS pressure is 1300 psig and stable.
- Steam Generator **Wide** range levels are as follows:

  "A" 11%
  "B" 10%
  "C" 27%

Which ONE of the choices below completes the following statements?

Bleed and feed cooling __(1)__ required for the current conditions in accordance with EOP-15.0.

The steps in EOP-15.0 for establishing bleed and feed direct operators to open __(2)__ Pressurizer PORV(s).

A. 1) Is **not**
   2) 1.

B. 1) Is **not**
   2) 3.

C. 1) is
   2) 1.

D. 1) is
   2) 3.

58. Given the following plant conditions:

- 100% power.
- 1B EDG is inoperable and **out of service** for emergent repairs.
- A spurious lockout has occurred on XTF0032, EMERG AUX XFMR.

Which ONE of the following identifies the Pressurizer heaters that still have an electrical power source **available**?

ASSUME NO OPERATOR ACTIONS

A. Backup group 1 **only**.

B. Backup group 1 and Backup group 2 **only**.

C. Backup group 1 and the Control group **only**.

D. Backup group 1, Backup group 2 **and** the Control group.

59. Initial conditions:

- 100% power.
- I&C reported that DRPI Data train "A" was suspect and recommended removing the train from service for troubleshooting.
- Data train "A" has been removed from service in accordance with SOP-403, ROD CONTROL AND POSITION INDICATING SYSTEM.
- Indications associated with Control Bank "D" rods are as follows:

  174 steps on DRPI
  172 steps on the "D" Bank Demand Step Counter.

Which ONE of the following states the possible range of **actual** rod positions for Control Bank "D" rods?

A. 170 - 184 steps

B. 168 - 182 steps

C. 164 - 178 steps

D. 162 - 176 steps

60. Given the following plant conditions:

- The Reactor has tripped and is stabilizing in HOT STANDBY.
- Train 'A' of the Core Cooling Monitor is selected to "DEG F MAR".
- The following Train 'A' temperature indications exist:
  - Hottest Wide-Range RTD = 557°F.
  - Hottest core exit T/C = 567°F
- The following pressure indications exist:
  - PT-403, RC WIDE RNG PRESS TRANSMITTER = 2285 psig.
  - PT-444, PZR PRESS CONTROL PRESS XMTR = 2185 psig.

Which ONE of the following values will be the **largest** value that will be displayed when the "DEG F MAR" pushbutton is depressed on the Train A Core Cooling Monitor?

A. 82

B. 89

C. 92

D. 99

61. Given the following plant conditions:

- Mode 4.
- A Release Permit for a Reactor Building Purge is approved.
- Maintenance work is in progress on the personnel hatch door that must be completed to continue a plant startup.
- Reactor Building Alternate Purge is in service in accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM, Section 3.Q. STARTUP REACTOR BUILDING ALTERNATE PURGE SUPPLY AND EXHAUST.
- MVB-6063, H2 REMOVAL ALT PUR THROT is **partially open**.
- PI-8254, RB NR PRESS PSI currently reads **0.9 psi and increasing**.
  - An operator wishes to **reduce** RB pressure.

Which ONE of the choices below completes the following statements in accordance with SOP-114, REACTOR BUILDING VENTILATION SYSTEM?

To reduce RB pressure, the operator will throttle MVB-6063, H2 REMOVAL ALT PUR THROT in the __(1)__ direction.

While using SOP-114, Section Q, the operator must ensure that flow, as read on FI-8251, H2 PURGE FLOW CFM is maintained less than __(2)__ cfm.

A. 1) open
   2) 100

B. 1) open
   2) 5

C. 1) closed
   2) 100

D. 1) closed
   2) 5

62. Given the following plant conditions:

- Mode 6.
- A leak has begun on the suction of the in-service Spent Fuel Cooling Pump.
- Readings on LI-7431, POOL LEVEL, and LI-7433, POOL LEVEL, are both currently slowly decreasing.

Which of the choices below answer both of the following questions?

Which of the elevations below is **closest** to the expected level at which the Spent Fuel Pool will stabilize due to the leak?

ASSUME NO OPERATOR ACTIONS

A. 455'

B. 458'

C. 460'

D. 462'

63. Given the following plant conditions:

Time 1400

- All offsite power was lost (115 KV and 230 KV)
- Both EDGs **failed** to start
- Operators are taking actions in accordance with EOP-6.0, ECA-0.0 LOSS OF ALL ESF AC POWER.

Time 1500

- SG depressurization is in progress.
- SG Pressures are 500 psig and decreasing.
- RCS $T_{AVG\ is}$ 450°F and decreasing.
- RCP CBO flows are 4 gpm and increasing on each RCP.
- The Turbine Driven EFW pump is running.
- SG NR Levels are as follows:

"A"	16%, decreasing.
"B"	39%, decreasing.
"C"	17%, increasing.

- Source Range channels N31 and N32 are 350 cpm and increasing.

Which ONE of the following describes the appropriate action(s) regarding the steam generator depressurization in accordance with EOP-6.0?

A. Stop the SG depressurization to allow SG levels to recover to maintain secondary heat sink.

B. Stop the SG depressurization and allow the RCS to heat up to add negative reactivity.

C. Continue the depressurization to allow accumulators to inject boron and add negative reactivity.

D. Continue the depressurization to reduce differential pressure across the RCP seals.

64. Given the following plant conditions:

- 100% power.
- Condenser Vacuum Pumps "A" and "C" are in service.

Which ONE of the following will cause a Main Turbine trip due to a loss of Main Condenser vacuum?

A. Loss of output from XTF0032, EMERG AUX XFMR.

B. Trip of XPP-0042A, CO PUMP A.

C. Closure of MVB-102B, VAC PP C TO CNDSR B.

D. Opening of MOV-1-5A TURB DRN VLV.

65. Which ONE of the following sources of water flows directly into the Reactor Coolant Drain Tank?

A. Leakage from RCP #3 seals while at 100% power with normal conditions.

B. Flow through "A" RHR suction relief valve with the "A" RHR loop in service.

C. Flow though LCV-115A, LTDN DIVERT with VCT level at 95%.

D. RCP Seal Controlled Bleed Off with the abeyance seals activated.

66. Given the following plant conditions:

- A RO-licensed operator is to provide a temporary relief to the on-shift BOP.
- The on-shift BOP will not leave the Protected Area during the relief.
- The two operators are reviewing SAP-200, CONDUCT OF OPERATIONS, section 6.2.8, "Temporary or unexpected relief during shift only".

Consider the following turnover activities:

1 - Discussion of plant conditions and anticipated evolutions during the relief period.
2 - Review of the MCB controls, instrumentation and annunciators.
3 - Independent walkdown of the MCB.
4 - Completion of OAP-100.6 Attachment IX, RO RELIEF CHECKLIST.
5 - Station Log Book entry.

Which ONE of the following contains the **minimum** set of activities for temporary relief during shift duty, in accordance with SAP-200, section 6.2.8?

A. 1 and 2.

B. 1, 2, and 5.

C. 1, 3, and 5.

D. 1, 2, 3, 4 and 5.

67. Given the following plant conditions:

- A reactor startup is in progress in accordance with GOP-3 REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2).
- The Estimated Critical Condition is 130 steps on Control Bank D.
- Operators are preparing to withdraw Control Bank rods.

Which ONE of the choices below completes the following statement?

In the conditions above, GOP APPENDIX A, GENERIC OPERATING PRECAUTIONS requires ____.

A. shutdown by manual rod insertion if it appears that the reactor will be subcritical with Control Bank D above 130 steps.

B. tripping the reactor if criticality occurs with Control Bank positions below the low-low rod insertion limit.

C. emergency boration and shutdown by manual rod insertion if criticality occurs with Control Bank positions below the low-low rod insertion limit.

D. shutdown by manual rod insertion if overlapped withdrawal of Control Bank C begins with Control Bank B at 128 steps.

68. Given the following plant conditions:

- Mode 3.
- A Lockout-Tagout is being hung on the "A" Feedwater Booster Pump for maintenance.
  - A Red Danger Tag has just been attached to the **pump motor breaker**.

Which ONE of the choices below completes the following statements?

In accordance with SAP-201, EQUIPMENT TAGGING AND LOCKOUT-TAGOUT, a ____(1)____ was placed on the "A" Feedwater Booster Pump control switch in the Control Room.

In accordance with OAP-100.5, GUIDELINES FOR CONFIGURATION CONTROL AND OPERATION OF PLANT EQUIPMENT, the **next** Red Danger Tag that is required to be hung, after the pump motor breaker, will be on the ____(2)_____.

A. 1) Hold tag
   2) discharge valve.

B. 1) Hold tag
   2) suction valve.

C. 1) Caution tag
   2) discharge valve.

D. 1) Caution tag
   2) suction valve.

69. Given the following plant conditions:

- The plant is in Mode 5.
- Emergent maintenance is required on XBC1B, DC DISTRI BUS 1B BATTERY CHARGER, that will require declaring it **inoperable** for **2 hours**.
- XBC1A-1B, BACKUP BATTERY CHRG, is not available.
- XBA1B, DC DISTRIBUTION BUS 1B BATTERY, is in service.

Which ONE of the following choices below answers the following:

In the current MODE, a **minimum** of __(1)__ OPERABLE combination(s) of Battery and associated Battery Charger are required to meet the LCO of T.S. 3.8.2.2, DC SOURCES - SHUTDOWN without entry into an ACTION statement.

If Charger XBC1B is declared inoperable in Mode 5, then operators will be required to __(2)__ .

A. 1) two (2)
   2) immediately declare Battery XBA1B **inoperable**.

B. 1) two (2)
   2) demonstrate operability of Battery XBA1B within 1 hour

C. 1) one (1)
   2) immediately declare Battery XBA1B **inoperable**.

D. 1) one (1)
   2) demonstrate operability of Battery XBA1B within 1 hour

70. Given the following plant conditions:

- 100% power.
- A Reactor Building entry by Operations is required.
- HP has sampled the Reactor Building atmosphere and reports that Particulate, Gas and Iodine are at 0.1 DAC.
- The crew is utilizing OAP-108.1, CONTROL OF REACTOR BUILDING ENTRY.

Which ONE of the choices below answers both of the following questions?

1) What is the **preferred** point of entry?
2) What is a condition that is **required** to be satisfied before this RB entry in accordance with OAP-108.1?

A. 1) Escape Airlock.
   2) Incore detectors must be tagged out.

B. 1) Escape Airlock.
   2) RB Charcoal Cleanup Units must be in service.

C. 1) Personnel Airlock.
   2) Incore detectors must be tagged out.

D. 1) Personnel Airlock.
   2) RB Charcoal Cleanup Units must be in service.

71. Given the following plant conditions:

- 100% power initially.
- "A" steam generator (SG) is ruptured.
- EOP-4.0, E-3 STEAM GENERATOR TUBE RUPTURE is in progress.
- Chemistry reports that "A" SG activity is highly elevated and that "B" and "C" activities are elevated above normal.
- Operators are preparing to begin an RCS cooldown.
- The wind direction is from the East.

Which ONE of the following identifies an event that would increase the radiation hazard to someone standing on the bridge between the Auxilary Building and Control Building roofs as EOP-4.0 progresses?

Assume no other additional malfunctions occur.

A. "A" Motor-driven EFW pump trips.

B. All Circulating Water pumps trip.

C. Ruptured steam generator level reaches 85% Narrow Range level.

D. Ruptured steam generator pressure reaches 1092 psig.

72. Given the following plant conditions:

- A LOCA inside the RB has occurred.
- The use of planned dose limits in accordance with VCS-EPP-020, EMERGENCY PERSONNEL EXPOSURE CONTROL has been authorized by the Emergency Director.
- A task must be performed in a penetration room in the Auxiliary Building in an area that has elevated radiation levels.
- The task is **not** required to save valuable equipment, for lifesaving, or to protect large populations.

Which ONE of the following is the **maximum** emergency dose a V.C. Summer employee may receive to perform the task described above in accordance with EPP-020?

A. 4 rem.

B. 5 rem.

C. 10 rem.

D. 25 rem.

73. Given the following plant conditions:

- 100% power initially.
- A LOCA occurred.
- RCS pressure is 780 psig and stable.
- RWST level is 30% and decreasing.
- RB pressure is 8 psig and increasing.

Which ONE of the choices below answers both of the following questions:

1) What is the setpoint for the **first** alarm that will alert operators that transfer to EOP-2.2, ES-1.3 TRANSFER TO COLD LEG RECIRCULATION is **immediately** required based on RWST level?

2) What is an action that occurs automatically at this RWST level?

A. 1) 6%.
   2) MVG-3004A and MVG-3005A, SUMP ISOL LOOP A, will both open.

B. 1) 6%.
   2) MVG-8706A(B), RHR LP A(B) TO CHG PP will both open.

C. 1) 18%.
   2) MVG-3004A and MVG-3005A, SUMP ISOL LOOP A, will both open.

D. 1) 18%.
   2) MVG-8706A(B), RHR LP A(B) TO CHG PP will both open.

74. Given the following plant conditions:

- 100% power initially.
- A large break LOCA occurred.
- The STA is now monitoring Critical Safety Function Status Trees.
- Total EFW flow is 350 gpm.
- All Narrow Range Steam Generator levels are 42% and increasing.
- RB pressure is 56 psig.
- Core Exit Thermocouples are 700°F and increasing.
- Source Range Startup rate is positive.

Which ONE of the following identifies a Critical Safety Function with a **RED** status in the current condition?

A. Subcriticality.

B. Core Cooling.

C. Heat Sink.

D. Containment.

75. Which ONE of the choices answers both of the following questions in accordance with VCS-EPP-002, COMMUNICATION AND NOTIFICATION?

    1) What is the **lowest** Emergency Action Level at which ERO responders are **required** to report to their duty stations?

    2) What is the **preferred** method that the assigned communicator will use to notify ERO responders that they must report?

    A. 1) Alert.
       2) Activation of an automated messaging system.

    B. 1) Alert
       2) Verbal phone notification using a Call Tree.

    C. 1) Site Area Emergency.
       2) Activation of an automated messaging system.

    D. 1) Site Area Emergency.
       2) Verbal phone notification using a Call Tree.

(REACTOR OPERATOR)

ANSWER KEY REPORT

for 2017 NRC (15-01) Test Form: 0

Answers

#	0
1	B
2	B
3	A
4	D
5	C
6	D
7	A
8	B
9	B
10	C
11	C
12	B
13	B
14	B
15	C
16	D
17	A
18	A
19	B
20	C
21	D
22	B
23	B
24	D
25	A
26	A
27	C
28	A
29	A
30	C
31	B
32	D
33	A
34	D
35	A
36	C
37	C
38	D
39	B
40	B
41	C
42	C
43	C
44	D
45	A
46	A
47	B

ANSWER KEY REPORT

for 2017 NRC (15-01) Test Form: 0

	Answers
#	0
48	C
49	B
50	D
51	C
52	D
53	A
54	D
55	C
56	B
57	D
58	C
59	A
60	D
61	A
62	C
63	B
64	C
65	A
66	A
67	C
68	A
69	D
70	A
71	B
72	B
73	C
74	D
75	A